

NASA/SP—2000—7501/SUPPL4



NASA THESAURUS SUPPLEMENT

A three-part cumulative update of the
1998 edition of the *NASA Thesaurus*

January 2000

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**National Aeronautics and
Space Administration**

January 2000

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Introduction

This Supplement is a cumulative update to the 1998 edition of the *NASA Thesaurus* (NASA/SP—1998–7501). The update includes all new terms and associated hierarchies added between the cut-off for the 1998 edition (December 1997) through December 31, 1999. Parts 1 and 2 of this *Supplement* correspond to Volumes 1 and 2 of the printed edition of the *NASA Thesaurus*. Supplements are normally published every six months.

Part 1 (*Hierarchical Listing*) contains the full hierarchical structure for each new term along with all new cross references and term definitions.

Display elements comprising the hierarchical listing are as follows:

Display Element	Notation
Generic Structure	GS
Related Term	RT
Use	USE
Use For	UF
Scope Note	SN
Definition	DEF
Array Terms	∞

For a fuller explanation, see the Introduction (pages viii–xi) in the printed version of the 1998 *NASA Thesaurus*, Volume 1.

Part 2 (*Rotated Term Display*) is a ready reference tool which provides additional ‘access points’ to the thesaurus terminology. It contains the postable terms and nonpostable cross references found in the Hierarchical Listing (Part 1) arranged in a KWIC (key-word-in-context) index.

Part 3 (*Changes*) is a listing of deletions or changes to postable terms or USE references made since the 1998 edition of the *NASA Thesaurus*. To control the size of the Supplement, only significant changes in term hierarchies and related term lists are presented.

NOTE: Other resources and products related to the NASA Thesaurus can be found at the following URL: <http://www.sti.nasa.gov/thesfrm1.htm>.

In addition to the above mentioned resources, a thesaurus listserv has been set up for submitting candidate terms and discussion of related lexicographical issues. A listing of candidate and accepted new terms is posted monthly. To subscribe to this listserv, send an e-mail message to listserv@sti.nasa.gov. Leave the subject line blank and in the message section, type **SUBSCRIBE THESAURUS–L <Your name>**. (Should you wish to cancel your subscription, send a message to the same address with UNSUBSCRIBE in the message section.)

Comments and suggestions regarding the NASA Thesaurus should be directed to:

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NASA Center for AeroSpace Information
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Fax: (301) 621–0134
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NASA THESAURUS SUPPLEMENT

PART 1 HIERARCHICAL LISTING

A

ACE satellite

USE **Advanced Composition Explorer**

Advanced Composition Explorer

(added December 1999)

DEF Explorer spacecraft (launched August 25, 1997) carrying six high-resolution sensors and three monitoring instruments for sampling low-energy particles of solar origin and high-energy galactic particles. From a vantage point approximately 1/100 of the distance from the Earth to the Sun, the Advanced Composition Explorer (ACE) can perform measurements over a wide range of energy and nuclear mass, under all solar wind flow conditions and during both large and small particle events including solar flares. When reporting space weather ACE can provide an advance warning of geomagnetic storms.

UF *ACE satellite*

GS artificial satellites
. scientific satellites

.. Explorer satellites

... **Advanced Composition Explorer**

RT energetic particles
galactic cosmic rays
interplanetary medium
solar corpuscular radiation
solar cosmic rays
solar wind
space weather

aeroshells

(added May 1999)

DEF Aerodynamic structural shells that attach to, or comprise a portion of, the exterior of an aerospace vehicle or space probe; especially such structures that support atmospheric entry, aerobraking, aeroassist, or hypersonic flight.

GS aerodynamic configurations

. **aeroshells**

RT aeromaneuvering
nose cones
reentry vehicles
spacecraft design
spacecraft shielding
spacecraft structures

Alpha Magnetic Spectrometer

(added June 1998)

UF *AMS (spectrometer)*

GS measuring instruments
. spectrometers

.. **Alpha Magnetic Spectrometer**

RT antimatter
Cerenkov counters
cosmic rays
dark matter
International Space Station
interstellar matter
magnetic spectroscopy
space station payloads
spaceborne astronomy

AM-1 (EOS) spacecraft

USE **Terra spacecraft**

AMS (spectrometer)

USE **Alpha Magnetic Spectrometer**

anisoplanatism

(added May 1999)

DEF In adaptive optics (AO) systems, a performance-degrading effect that arises whenever light from the wave-front sensor beacon and light from the target object sample different volumes of optical turbulence. This effect results in an increased value of the aperture-averaged residual phase variance after AO compensation, which causes an exponential decrease in system performance.

RT aberration
adaptive optics
atmospheric correction
atmospheric optics
image resolution
optical correction procedure
phase error
telescopes

antenna gain

(added June 1998)

GS amplification

. **antenna gain**

RT antennas
automatic gain control
directional antennas
effectiveness
high gain
signal reception

antiphase boundaries

(added March 1998)

UF *antiphase domains*

APB (materials)

GS boundaries

. **antiphase boundaries**

RT binary alloys
crystal dislocations
crystal lattices
crystal structure
grain boundaries
interfacial energy
intermetallics
microstructure
order-disorder transformations
solid solutions
solid-solid interfaces
superlattices
ternary alloys

antiphase domains

USE **antiphase boundaries**

APB (materials)

USE **antiphase boundaries**

archaeomagnetism

USE **paleomagnetism**

associative memory

(added December 1999)

DEF A method or device for data storage in which data is identified by a part or properties of its content, rather than by an address or relative position.

UF *associative storage*

content-addressable memory

GS memory (computers)

. **associative memory**

RT associative processing (computers)
computer storage devices
neural nets
optical memory (data storage)

associative storage

USE **associative memory**

bevel gears

(added May 1999)

GS gears

. **bevel gears**

.. spiral bevel gears

RT gear teeth

biomass burning

(added December 1999)

DEF Burning of vegetation in forests, grasslands, and agricultural lands usually carried out to clear the land and change its use; a significant contributor to the global budgets of many radiatively and chemically active gases and particulates in the atmosphere.

GS combustion

. **biomass burning**

RT air pollution
climate change
combustion products
contaminants
deforestation
environment pollution
forest fires
man environment interactions
smoke

Biot-Savart law

(added August 1998)

DEF Law describing the intensity of a magnetic field produced by a current carrying wire. Also applied in fluid dynamics to describe the flow-velocity field induced by a vortex.

GS laws

. **Biot-Savart law**

RT electromagnetism
flow velocity
magnetic fields
Maxwell equation
vortices

Boeing 717 aircraft

(added October 1998)

GS Boeing aircraft

. **Boeing 717 aircraft**

.. commercial aircraft

... **Boeing 717 aircraft**

jet aircraft

.. turbfan aircraft

... **Boeing 717 aircraft**

monoplanes

. **Boeing 717 aircraft**

passenger aircraft

. **Boeing 717 aircraft**

transport aircraft

. **Boeing 717 aircraft**

RT∞ aircraft

bohrium

bohrium

(added May 1998)

- GS chemical elements
 - . bohrium
- RT hassium
- seaborgium

Bond number

(added December 1999)

DEF Dimensionless number representing the ratio between gravitational force and the surface tension of a bubble, drop, or meniscus.

- GS dimensionless numbers
 - . **Bond number**
- RT drops (liquids)
- gravitational effects
- interfacial tension
- menisci

cascode devices

(added August 1998)

DEF Amplifier devices consisting of a common grounded-emitter (cathode) or source stage that drives a grounded-base output stage, resulting in high-impedance, high-gain, and low-noise,

- GS amplifiers
 - . **cascode devices**
 - electronic equipment
 - . solid state devices
 - . . semiconductor devices
 - . . . **cascode devices**
- RT CMOS
- field effect transistors
- high electron mobility transistors
- switching circuits
- transistor amplifiers
- transistor circuits
- transistors

chain reactions (chemistry)

(added May 1999)

- GS chemical reactions
 - . **chain reactions (chemistry)**
- RT chemical lasers
- combustion chemistry

chain reactions (nuclear physics)

(added May 1999)

- GS nuclear reactions
 - . nuclear fission
 - . . **chain reactions (nuclear physics)**
- RT fission products
- neutrons

Chandra X Ray Astrophysics Facility

USE **X Ray Astrophysics Facility**

clamped structures

(added February 1998)

- RT beams (supports)
- clamps
- composite structures
- joints (junctions)
- laminates
- plates (structural members)
- shells (structural forms)
- structural members
- structural vibration
- ∞ structures

cloud-to-cloud discharges

(added August 1999)

- GS electric current
 - . electric discharges
 - . . lightning
 - . . . **cloud-to-cloud discharges**

cloud-to-ground discharges

(added August 1999)

- GS electric current
 - . electric discharges
 - . . lightning
 - . . . **cloud-to-ground discharges**

Comet Nucleus Tour

(added February 1999)

DEF A NASA Discovery-class mission to acquire imagery and comparative spectral maps of comet nuclei and analyze comet dust flows. The mission spacecraft will fly to within 100 kilometers of at least three near-Earth comets including Comet Encke, Comet Schwassmann-Wachmann, and Comet d'Arrest.

- UF **CONTOUR (mission)**
- GS space missions
 - . flyby missions
 - . . **Comet Nucleus Tour**
- RT comet nuclei
- Encke comet
- Schwassmann-Wachmann comet
- swingby technique

content-addressable memory

USE **associative memory**

CONTOUR (mission)

USE **Comet Nucleus Tour**

Cooper-Harper ratings

(added August 1999)

- GS flight characteristics
 - . pilot ratings
 - . . **Cooper-Harper ratings**
 - ratings
 - . pilot ratings
 - . . **Cooper-Harper ratings**
- RT aircraft performance
- helicopter performance

corrugated waveguides

(added February 1998)

- GS waveguides
 - . **corrugated waveguides**
- RT gratings (spectra)
- optical waveguides
- waveguide antennas

cosmions

USE **weakly interacting massive particles**

critical current

(added December 1999)

DEF A current value in a superconductive material, at a particular constant temperature and in the absence of a magnetic field, below which the material is superconducting and above which the material behaves normally.

- GS electric current
 - . **critical current**
- RT critical temperature
- current density
- superconductivity
- superconductors (materials)

cuprates

(added April 1999)

- GS copper compounds
 - . **cuprates**
- RT BSCCO superconductors
- copper oxides
- YBCO superconductors

cycloaddition

(added June 1998)

DEF Pericyclic chemical reaction in which unsaturated molecules combine to form a cyclic compound under the influence of heat or light.

- GS chemical reactions
 - . **cycloaddition**
 - . . Diels-Alder reactions
- RT cyclic compounds
- photochemical reactions
- polymerization
- synthesis (chemistry)

Darkstar unmanned aerial vehicle

USE **pitotless aircraft**
reconnaissance aircraft

Deep Space 1 Mission

(added October 1998)

DEF First of several technology demonstration missions supporting the NASA New Millennium Program. Advanced technologies include an ion propulsion system, solar concentrator arrays, autonomous navigation and control systems, an integrated camera and imaging spectrometer, and several telecommunications and microelectronics devices. The mission plan includes a flyby of Asteroid 1992 KD.

- UF **DS1 (space mission)**
- GS space missions
 - . **Deep Space 1 Mission**
- RT asteroid missions
- autonomous navigation
- flyby missions
- interplanetary spacecraft
- ion propulsion
- NASA space programs
- solar electric propulsion

deformable mirrors

(added May 1998)

- GS mirrors
 - . **deformable mirrors**
- RT adaptive optics
- light modulation
- phase modulation
- segmented mirrors

Delta 3 launch vehicle

(added October 1998)

- GS launch vehicles
 - . Delta launch vehicle
 - . . **Delta 3 launch vehicle**

Delta 4 launch vehicle

(added October 1998)

- GS launch vehicles
 - . Delta launch vehicle
 - . . **Delta 4 launch vehicle**

dielectric waveguides

(added February 1998)

- GS waveguides
 - . **dielectric waveguides**
- RT dielectrics
- microwave transmission
- optical waveguides
- waveguide antennas
- waveguide filters

differential games

(added October 1998)

- GS games
 - . **differential games**
- RT minimax technique
- optimal control
- pursuit-evasion games
- stochastic processes

zero sum games

digital cameras
(added July 1998)
GS optical equipment
. cameras
. . **digital cameras**
photographic equipment
. cameras
. . **digital cameras**
RT CCD cameras
digital systems
digital techniques
photogrammetry
television cameras
video equipment

DS1 (space mission)
USE **Deep Space 1 Mission**

dubnium
(added May 1998)
GS chemical elements
. **dubnium**
RT rutherfordium
seaborgium

EAM (physical chemistry)
USE **embedded atom method**

ekranoplanes
USE **wing-in-ground effect vehicles**

electronic structure
(added April 1999)
SN (THE TERM "ATOMIC STRUCTURE" WAS USED FOR THIS CONCEPT PRIOR TO MAY 1999)
RT atomic structure
band structure of solids
electron energy
electron orbitals
electron states
energy bands
energy gaps (solid state)
energy levels
Fermi liquids

embedded atom method
(added February 1998)
DEF A semiempirical calculation method developed by Daw and Baskes for determining the energetics of atoms in a bulk environment. The original form of the method was based on density functional theory and was intended primarily for tight-packed transition metals. More recent modifications have extended the applicability of the method to a large number of elements in the periodic table.
UF *EAM (physical chemistry)*
MEAM (physical chemistry)
modified embedded atom method
RT alloys
crystal defects
grain boundaries
interatomic forces
metals
∞ methodology
molecular dynamics
potential energy

enantiomeric compounds
USE **enantiomers**

enantiomers
(added August 1998)
DEF Isomeric pairs whose crystalline forms or molecular structures are non-superimposable mirror images.
UF *enantiomeric compounds*

enantiomorphs
GS isomers
. **enantiomers**
RT chirality
crystal structure
isomorphism
molecular structure
stereochemistry
symmetry

enantiomorphs
USE **enantiomers**

environmental cleanup
(added February 1999)
GS cleaning
. **environmental cleanup**
RT decontamination
environment management
environment protection
hazardous wastes
oil pollution
oil slicks
pollution control
reclamation
soil pollution
waste disposal
waste treatment
water pollution
water treatment

EOS AM-1 spacecraft
USE **Terra spacecraft**

Euler-Bernoulli beam theory
USE **Euler-Bernoulli beams**

Euler-Bernoulli beams
(added April 1998)
UF *Euler-Bernoulli beam theory*
GS structural members
. beams (supports)
. . **Euler-Bernoulli beams**
RT axial strain
bending
bending vibration
dynamic structural analysis
elastic properties
mathematical models
partial differential equations
structural analysis
Timoshenko beams

evanescent waves
(added March 1998)
GS surface waves
. **evanescent waves**
RT acoustic impedance
evanescence
fiber optics
internal waves
plane waves
propagation modes
reflected waves
wave propagation
∞ waves

FDTD (mathematics)
USE **finite difference time domain method**

ferroelastic materials
(added June 1998)
GS **ferroelastic materials**
. shape memory alloys
. . nitinol alloys
RT ceramics
ferroelasticity
ferroelectric materials
∞ materials

smart materials

ferroelasticity
(added June 1998)
GS mechanical properties
. elastic properties
. . **ferroelasticity**
RT crystal structure
domain wall
ferroelastic materials
ferroelectricity
phase transformations
shape memory alloys
smart materials

fiber pushout
(added September 1999)
GS releasing
. **fiber pushout**
RT ceramic matrix composites
composite materials
debonding (materials)
destructive tests
failure modes
fiber composites
fiber pullout
fiber-matrix interfaces
fibers
interfacial energy
∞ materials tests
metal matrix composites
reinforcing fibers

field tests
(added November 1998)
SN (EXCLUDES TESTS OF ELECTRIC, MAGNETIC, OR ELECTROMAGNETIC FIELDS)
DEF Tests carried out in the actual setting in which the subject device is intended to operate.
RT environmental tests
performance tests
∞ tests

finite difference time domain method
(added April 1999)
UF *FDTD (mathematics)*
GS analysis (mathematics)
. numerical analysis
. . approximation
. . . finite difference theory
. . . . **finite difference time domain method**
. time domain analysis
. . **finite difference time domain method**
RT computational electromagnetics
electromagnetic scattering

free-space optical communication
(added June 1998)
GS telecommunication
. communication
. . optical communication
. . . **free-space optical communication**
RT high power lasers
laser beams
satellite communication
space communication

free-space optical interconnects
(added June 1998)
UF *FSOI (integrated optics)*
GS optical interconnects
. **free-space optical interconnects**
RT integrated optics
interprocessor communication
optical computers

frequency domain analysis

optical switching
optoelectronic devices
photonics

frequency domain analysis

(added April 1999)

GS analysis (mathematics)
. **frequency domain analysis**
RT control systems design
dynamic response
frequency response
parameter identification
signal processing

FSOI (integrated optics)

USE **free-space optical interconnects**

fullerides

(added February 1998)

GS carbon compounds
. **fullerides**
RT ∞ alkali metal compounds
∞ chemical compounds
doped crystals
fullerenes
superconductors (materials)

fuselage-wing stores

USE **wing-fuselage stores**

fusion propulsion

(added September 1999)

GS propulsion
. nuclear propulsion
. . **fusion propulsion**
RT inertial confinement fusion
nuclear electric propulsion
nuclear fusion
nuclear rocket engines
plasma propulsion
spacecraft propulsion

Gabor filters

(added February 1998)

GS image filters
. **Gabor filters**
RT computer vision
∞ filters
Gabor transformation
image analysis
image processing
low pass filters
neural nets
spatial filtering
textures

Gabor transformation

(added February 1998)

GS transformations (mathematics)
. **Gabor transformation**
RT Fourier transformation
Gabor filters
holography
image processing
signal analysis
wavelet analysis

games

(added October 1998)

GS **games**
. differential games
. pursuit-evasion games
. war games
. zero sum games
RT control theory
game theory
optimization

Genesis mission

(added February 1999)

DEF A space mission to collect solar wind samples from a halo orbit about the sun-Earth L1 point for two years, returning those samples to Earth in 2003 for analysis and examination. Analysis of the samples collected by the mission will contribute to an understanding of the origins of the solar system.

GS space missions
. **Genesis mission**
RT solar system evolution
solar wind

glucocorticoids

(added December 1999)

DEF Adrenocortical steroid hormones that are involved in the metabolism of fats, proteins, and carbohydrates, and have anti-inflammatory properties.

GS organic compounds
. lipids
. . steroids
. . . corticosteroids
. . . . **glucocorticoids**
secretions
. endocrine secretions
. . hormones
. . . corticosteroids
. . . . **glucocorticoids**
RT adrenal gland
atrophy
carbohydrate metabolism
hormone metabolisms
hypokinesia
lipid metabolism
muscles
protein metabolism

Godunov method

(added February 1998)

DEF Non-oscillatory finite-volume scheme that incorporates the exact or approximate solution to the Riemann initial-value problem, or a generalization of it.

GS analysis (mathematics)
. numerical analysis
. . finite volume method
. . . **Godunov method**
procedures
. finite volume method
. . **Godunov method**
RT approximation
Cauchy problem
Cauchy-Riemann equations
computational fluid dynamics
Euler equations of motion
finite difference theory
shock wave interaction
supersonic flow

H-2 control

(added February 1998)

GS automatic control
. optimal control
. . **H-2 control**
optimization
. optimal control
. . **H-2 control**
RT control systems design
control theory
controllers
feedback control
H-infinity control
linear quadratic Gaussian control

Hale-Bopp comet

(added July 1998)

DEF Long-period comet discovered July 23, 1995; designated C/1995 O1.
GS celestial bodies
. comets
. . **Hale-Bopp comet**
RT Oort cloud

hardware-in-the-loop simulation

(added February 1999)

UF *hardware-in-the-loop tests*
GS simulation
. **hardware-in-the-loop simulation**
RT computerized simulation
control simulation
performance tests
systems simulation

hardware-in-the-loop tests

USE **hardware-in-the-loop simulation**

hassium

(added May 1998)

GS chemical elements
. **hassium**
RT bohrium
meitnerium

head up tilt

(added March 1998)

DEF Body posture while lying on a tilt table with the head higher than the rest of the body.
UF *HUT (physiology)*
GS posture
. **head up tilt**
RT aerospace medicine
bed rest
bioastronautics
cardiovascular system
gravitational physiology
head down tilt
hemodynamic responses
lower body negative pressure
orthostatic tolerance
physiological responses
supine position
weightlessness simulation

heavy fermion superconductors

(added April 1999)

GS conductors
. superconductors (materials)
. . **heavy fermion superconductors**
intermetallics
. heavy fermion systems
. . **heavy fermion superconductors**

heavy fermion systems

(added April 1999)

GS intermetallics
. **heavy fermion systems**
. . heavy fermion superconductors
RT fermions
superconductors (materials)

heavy metals

(added July 1999)

DEF Metals or alloys having a high specific gravity; usually ones with a density greater than 5 grams per cubic centimeter.

GS metals
. **heavy metals**
RT cadmium
chromium
contaminants
copper
industrial wastes

lead (metal)
mercury (metal)
soil pollution
toxic hazards
zinc

hindcasting

(added July 1999)

DEF The process of reconstructing the time and space evolution of an atmospheric or oceanic phenomenon that has occurred in the past, through an analysis of historical data, a mathematical-model simulation of the processes involved, or a combination of data analysis and modeling.

GS predictions
. **hindcasting**

RT forecasting
meteorological parameters
nowcasting
oceanographic parameters
weather forecasting

HUT (physiology)

USE **head up tilt**

hybrid-Trefftz finite element method

USE **finite element method**
Trefftz method

hypothetical particles

(added November 1999)

GS particles
. elementary particles
. . . **hypothetical particles**
. . . gluons
. . . gravitinos
. . . gravitons
. . . partons
. . . quarks
. . . tachyons
. . . weakly interacting massive particles

hypothetical planets

(added June 1998)

UF *Phaethon (hypothetical planet)*
planet X
transplutonic planets
GS celestial bodies
. planets
. . . **hypothetical planets**
RT comets
extrasolar planets
planetary orbits

in vitro methods and tests

(added May 1999)

DEF Tests of, or methods related to, biological or biochemical processes occurring in an artificial environment or outside of a living cell or organism.

RT bioassay
biotechnology
conditions
culture techniques
cytology
fertilization
histology
in vivo methods and tests
∞ methodology
∞ tests

in vivo methods and tests

(added May 1999)

DEF Tests of, or methods related to, biological or biochemical processes occurring within a living cell or organism.

RT bioassay

biotechnology
conditions
culture techniques
cytology
histology
in vitro methods and tests
intravenous procedures
∞ methodology
∞ tests

inflight simulation

USE **in-flight simulation**

in-flight simulation

(added October 1998)

DEF The use of a specialized test aircraft to simulate the flight characteristics of another vehicle. The test aircraft is typically capable of duplicating the computed responses of the simulated vehicle through special aerodynamic and control system features.

UF *inflight simulation*
GS simulation
. flight simulation
. . . **in-flight simulation**

RT aircraft control
flight characteristics
flight control
flight simulators
flight tests
training simulators

intelligent materials

USE **smart materials**

intercalibration

(added January 1999)

DEF Calibration between two or more data sources, including (1) the comparison of data sets acquired by different types of measurement systems for the purpose of deducing the calibration values for one of the measurement systems; (2) the mutual calibration of data from different measurement systems through the comparison of the data with model calculations; and (3) the calibration of multiple detectors on a single instrument through the comparison of data from each detector.

GS calibrating
. **intercalibration**
RT comparison
correction
multisensor applications
standardization

intracloud discharges

(added August 1999)

GS electric current
. electric discharges
. . . lightning
. . . **intracloud discharges**

ion optics

(added June 1998)

RT beam waveguides
beamforming
electron optics
ion beams
ion engines
ion propulsion
mass spectrometers
∞ optics

Iridium network

(added December 1998)

DEF A 66-satellite wireless personal telecommunications network designed to provide world-

wide telephone, paging, facsimile and data services to handheld or mobile equipment.

UF *Iridium satellites*
GS networks
. communication networks
. . . **Iridium network**
. satellite networks
. . . satellite constellations
. . . **Iridium network**
RT communication satellites
facsimile communication
mobile communication systems
satellite communication
telephony
wireless communication

Iridium satellites

USE **communication satellites**
Iridium network

Java (programming language)

(added December 1998)

GS languages
. programming languages
. . . high level languages
. . . **Java (programming language)**
RT C++ (programming language)
client server systems
internets
object-oriented programming
World Wide Web

Josephson effect

(added April 1999)

UF *Josephson tunneling*
RT electron tunneling
Josephson junctions
SIS (superconductors)
superconducting devices
superconductors (materials)

Josephson tunneling

USE **Josephson effect**

kink bands

(added March 1998)

RT buckling
compression loads
edge dislocations
failure modes
fiber composites
microstructure
plastic deformation
reinforcing fibers
single crystals

kinking

(added April 1998)

RT bending
buckling
compression loads
cracking (fracturing)
deformation
displacement
failure modes
fiber composites
folding
heaving
twisting
wrinkling

Laves phases

(added August 1998)

GS solid phases
. **Laves phases**
RT alloys
crystal lattices
crystal structure

leaders (meteorology)

cubic lattices
interstitials
microstructure
phase transformations

leaders (meteorology)

(added August 1999)

GS electric current
. electric discharges
. . lightning
. . . **leaders (meteorology)**
. . . . stepped leaders

lithium batteries

(added December 1999)

GS electrochemical cells
. electric batteries
. . **lithium batteries**
. . . lithium sulfur batteries

RT storage batteries

Long March launch vehicles

(added January 1999)

GS launch vehicles
. **Long March launch vehicles**

RT Chinese space program
Chinese spacecraft
heavy lift launch vehicles

Lunar Prospector

(added February 1998)

GS artificial satellites
. lunar satellites
. . **Lunar Prospector**
lunar spacecraft
. lunar satellites
. . **Lunar Prospector**

RT lunar composition
lunar exploration
lunar programs
lunar resources
lunar surface

MACHOs (astronomy)

USE **massive compact halo objects**

magnetic nozzles

(added September 1999)

DEF Nozzle devices used in some nuclear and plasma propulsion systems that utilize magnetic fields to direct and accelerate plasma flows, thereby providing thrust for propulsion.

RT coaxial plasma accelerators
electric rocket engines

∞ nozzles
nuclear propulsion
nuclear rocket engines
plasma acceleration
plasma engines
plasma propulsion
rocket nozzles
spacecraft propulsion

magnetostratigraphy

(added April 1999)

GS stratigraphy
. **magnetostratigraphy**

RT geochronology
paleomagnetism

Mars Climate Orbiter

(added March 1999)

DEF One of two spacecraft comprising the Mars Surveyor 98 program; launched December 1998. After obtaining a polar, nearly circular orbit around Mars, the Orbiter will serve as a radio relay during the Lander surface mission, then begin monitoring the atmosphere, surface, and polar

caps for a complete Martian year. The Orbiter carries two science instruments: the Pressure Modulated Infrared Radiometer and the Mars Color Imager.

UF *Mars Surveyor 98 Orbiter*

GS interplanetary spacecraft
. Mars probes
. . **Mars Climate Orbiter**
unmanned spacecraft
. space probes
. . Mars probes
. . . **Mars Climate Orbiter**

RT Mars atmosphere
Mars missions
Mars Polar Lander
Mars surface
Mars Surveyor 98 Program

Mars Global Surveyor

(added March 1999)

DEF Spacecraft and related mission designed to orbit Mars over a two year period and collect data on the surface morphology, topography, composition, gravity, atmospheric dynamics, and magnetic field. Launched November 1996.

UF *MGS (spacecraft)*

GS interplanetary spacecraft
. Mars probes
. . **Mars Global Surveyor**
unmanned spacecraft
. space probes
. . Mars probes
. . . **Mars Global Surveyor**

RT Mars atmosphere
Mars missions
Mars Observer
Mars surface

Mars missions

(added February 1999)

GS space missions
. **Mars missions**
. . manned Mars missions
. . Mars sample return missions
. . Mars Surveyor 2001 Mission

RT Earth–Mars trajectories
Mars Climate Orbiter
Mars exploration
Mars Global Surveyor
Mars landing
Mars Observer
Mars Pathfinder
Mars Polar Lander
Mars probes
Mars surface samples
Mars Surveyor 98 Program

∞ missions
return to Earth space flight

Mars Polar Lander

(added March 1999)

DEF One of two spacecraft comprising the Mars Surveyor 98 program; launched January 1999. After a soft landing near the Martian south pole, the Lander will search for near-surface ice and possible surface records of cyclic climate change, and characterize physical processes key to the seasonal cycles of water, carbon dioxide and dust on Mars. Prior to landing, the Deep Space 2 microprobes will be released as part of a technology-validation mission related to multiple-lander spacecraft.

UF *Mars Surveyor 98 Lander*

GS interplanetary spacecraft
. Mars probes
. . **Mars Polar Lander**
unmanned spacecraft

. space probes
. . Mars probes
. . . **Mars Polar Lander**

RT Mars atmosphere
Mars Climate Orbiter
Mars missions
Mars surface
Mars Surveyor 98 Program

Mars Surveyor 98 Lander

USE **Mars Polar Lander**

Mars Surveyor 98 Orbiter

USE **Mars Climate Orbiter**

Mars Surveyor 98 Program

(added March 1999)

DEF Mars exploration program consisting of two mission spacecraft—the Mars Climate Orbiter and the Mars Polar Lander. Two surface penetrating microprobes (part of the associated Deep Space 2 mission) for detecting water ice are also piggybacking on the Lander.

GS programs
. NASA programs
. . NASA space programs
. . . **Mars Surveyor 98 Program**
. space programs
. . NASA space programs
. . . **Mars Surveyor 98 Program**

RT Mars atmosphere
Mars Climate Orbiter
Mars missions
Mars Polar Lander
Mars surface

Mars Surveyor 2001 Mission

(added July 1999)

GS space missions
. Mars missions
. . **Mars Surveyor 2001 Mission**

RT Mars environment
Mars surface
Mars surface samples
NASA space programs

Martian meteorites

USE **SNC meteorites**

massive compact halo objects

(added November 1999)

DEF Objects, such as brown dwarfs, black holes, and massive planets, hypothesized to account for the dark matter in the halo of the Milky Way. The signature of these objects is the occasional amplification of the light from extragalactic stars by the gravitational lens effect.

UF *MACHOs (astronomy)*

GS celestial bodies
. **massive compact halo objects**

RT brown dwarf stars
dark matter
galactic halos
gravitational lenses
Milky Way Galaxy
missing mass (astrophysics)
red dwarf stars

MEAM (physical chemistry)

USE **embedded atom method**

meitnerium

(added May 1998)

GS chemical elements
. **meitnerium**

RT hassium

MEMS (electromechanical devices)

USE **microelectromechanical systems**

*MGS (spacecraft)*USE **Mars Global Surveyor****microelectromechanical systems***(added October 1998)*

UF *MEMS (electromechanical devices)*
 GS electromechanical devices
 . **microelectromechanical systems**
 RT microinstrumentation
 microminiaturization
 microminiaturized electronic devices
 microsattellites
 nanosatellites

microsatellites*(added October 1998)*

DEF Satellites with a total mass between 10 and 100 kg often incorporating miniaturized electronic and mechanical systems.

UF *microsats*
 GS artificial satellites
 . **microsatellites**
 RT microelectromechanical systems
 microminiaturization
 microminiaturized electronic devices
 nanosatellites
 satellite constellations
 satellite design
 small satellite technology
 small scientific satellites

*microsats*USE **microsatellites***Mindlin plate theory*USE **Mindlin plates****Mindlin plates***(added April 1998)*

UF *Mindlin plate theory*
Reissner–Mindlin plates
 GS structural members
 . plates (structural members)
 . . **Mindlin plates**
 RT dynamic structural analysis
 finite element method
 free vibration
 plate theory
 Reissner theory
 shear strain
 structural analysis
 structural vibration
 thick plates

mischmetal*(added June 1998)*

DEF An alloy consisting of a natural mixture of rare–earth metals; used in electrode materials and hydrogen–storage alloys, as a general alloy addition, and in the production of some aluminum alloys and steels.

GS alloys
 . rare earth alloys
 . . **mischmetal**
 RT alloying
 aluminum alloys
 cathodic coatings
 cerium
 desorption
 electrode materials
 intermetallics
 steels

*modified embedded atom method*USE **embedded atom method***nacelle wing configurations*USE **wing nacelle configurations****nanosatellites***(added October 1998)*

DEF Satellites with a total mass smaller than 10 kg incorporating miniaturized electronic and mechanical systems.

UF *nanosats*
 GS artificial satellites
 . **nanosatellites**
 RT microelectromechanical systems
 microminiaturization
 microminiaturized electronic devices
 microsattellites
 satellite constellations
 satellite design
 small satellite technology
 small scientific satellites

*nanosats*USE **nanosatellites****Next Generation Space Telescope project***(added December 1999)*

DEF Project in the NASA Origins program with the goal of developing a spaceborne observatory to succeed the Hubble Space Telescope after 2005. The telescope is foreseen to have an aperture of 8 meters and be optimized for near infrared wavelengths (0.6–10+ microns) in order to enable the exploration of the most remote high redshift universe.

UF *NGST project*
 GS programs
 . projects
 . . **Next Generation Space Telescope project**
 RT astronomical observatories
 infrared telescopes
 NASA space programs
 spaceborne telescopes

*NGST project*USE **Next Generation Space Telescope project****Nozomi Mars Orbiter***(added August 1998)*

DEF A Japanese Mars mission spacecraft designed to study the Martian upper atmosphere and its interaction with the solar wind, and to develop technologies for use in future planetary missions. Specifically, instruments on the spacecraft enable the measurement of the structure, composition and dynamics of the ionosphere; aeronomy effects of the solar wind; the escape of atmospheric constituents; the intrinsic magnetic field; and dust in the upper atmosphere and in–orbit around Mars.

UF *Planet–B spacecraft*
 GS interplanetary spacecraft
 . Mars probes
 . . **Nozomi Mars Orbiter**
 Japanese spacecraft
 . **Nozomi Mars Orbiter**
 unmanned spacecraft
 . space probes
 . . Mars probes
 . . . **Nozomi Mars Orbiter**
 RT aeronomy
 Deimos
 Phobos
 planetary atmospheres
 solar planetary interactions

optical interconnects*(added June 1998)*GS **optical interconnects**

. free–space optical interconnects
 RT connectors
 electric connectors
 integrated optics
 optical computers
 optical switching
 optoelectronic devices
 photonics

orbit determination*(added December 1998)*

GS **orbit determination**
 . airborne range and orbit
 determination
 . orbit calculation
 . . minimum variance orbit
 determination
 . . orbital position estimation
 RT Global Positioning System
 position errors
 satellite tracking
 space navigation
 spacecraft control
 spacecraft position indicators

*PDS (spectroscopy)*USE **photothermal deflection spectroscopy****perfectly matched layers***(added July 1998)*

DEF In the area of computational electromagnetism, an absorbing boundary condition used for terminating infinite domain calculations in the finite–difference time–domain (FDTD) or finite element methods. The approach has also been extended to the analysis of some problems in acoustics.

UF *PML (electromagnetism)*
 GS conditions
 . boundary conditions
 . . **perfectly matched layers**
 RT computational electromagnetics
 computational grids
 electromagnetic absorption
 electromagnetic scattering
 finite difference theory
 finite element method
 Maxwell equation

*Phaethon (hypothetical planet)*USE **hypothetical planets****Phobos spacecraft***(added August 1998)*

DEF Two Soviet spacecraft (Phobos 1 and 2, both launched in July 1988) designed to study the plasma environment in the Martian vicinity, the surface and atmosphere of Mars, and the surface composition of the Martian satellite Phobos. Other mission objectives included the study of the interplanetary environment and solar observations.

GS interplanetary spacecraft
 . Mars probes
 . . **Phobos spacecraft**
 Soviet spacecraft
 . **Phobos spacecraft**
 unmanned spacecraft
 . space probes
 . . Mars probes
 . . . **Phobos spacecraft**
 RT Mars atmosphere
 Mars environment
 Phobos

photothermal deflection spectroscopy

photothermal deflection spectroscopy

(added November 1998)

UF *PDS (spectroscopy)*

GS spectroscopy
. **photothermal deflection spectroscopy**

RT optical measurement
photoacoustic spectroscopy
thermal diffusivity
thermal lensing

pilot opinion ratings

USE **pilot ratings**

pilot ratings

(added August 1999)

DEF Subjective assessment of the handling and stability characteristics of an aircraft or other flight vehicle.

UF *pilot opinion ratings*

GS flight characteristics

. **pilot ratings**

. . Cooper–Harper ratings ratings

. **pilot ratings**

. . Cooper–Harper ratings

RT aircraft performance assessments
controllability
helicopter performance

planet X

USE **hypothetical planets**

Planet-B spacecraft

USE **Nozomi Mars Orbiter**

PML (electromagnetism)

USE **perfectly matched layers**

polyvinylidene

USE **vinylidene**

Population III stars

(added July 1999)

UF *primordial stars*

GS celestial bodies

. stars

. . **Population III stars**

RT cosmology
dark matter
relic radiation
stellar evolution
supermassive stars

primordial stars

USE **Population III stars**

proportional navigation

(added July 1998)

GS navigation

. **proportional navigation**

RT homing
interception
line of sight
missile control
proportional control
rendezvous guidance
terminal guidance

proton–antiproton interactions

(added June 1999)

GS particle interactions

. elementary particle interactions

. . **proton–antiproton interactions**

RT annihilation reactions
antiprotons
high energy interactions
matter–antimatter propulsion

pursuit–evasion games

(added October 1998)

GS games

. **pursuit–evasion games**

RT differential games
evasive actions
interception
optimal control
pursuit tracking
trajectory optimization
zero sum games

RBCC engines

USE **rocket–based combined–cycle engines**

Reissner–Mindlin plates

USE **Mindlin plates**

renewable energy

(added December 1998)

GS **renewable energy**

. geothermal energy utilization

. hydroelectricity

. tidepower

. waterwave energy

. windpower utilization

RT bioconversion
biomass energy production
clean energy
energy policy
∞ energy sources
energy technology
geothermal energy conversion
hydrogen–based energy
ocean thermal energy conversion
solar energy conversion
waste utilization
waterwave energy conversion

Ringleb flow

(added July 1998)

GS fluid flow

. compressible flow

. . **Ringleb flow**

. steady flow

. . **Ringleb flow**

. two dimensional flow

. . **Ringleb flow**

RT critical flow
subsonic flow
transonic flow

rocket–based combined–cycle engines

(added August 1999)

DEF Launch vehicle engines that integrate a high specific impulse, low thrust–to–weight, airbreathing engine with a low–impulse, high thrust–to–weight rocket. The engines are often defined by four modes of operation in a single–stage–to–orbit configuration. In the first mode, the engine functions as a rocket–driven ejector. When the rocket engine is switched off, subsonic combustion (mode 2) is present in the ramjet mode. As the vehicle continues to accelerate, supersonic combustion (mode 3) occurs in the ramjet mode. Finally, as the edge of the atmosphere is approached and the engine inlet is closed off, the rocket is reignited and the final ascent to orbit is undertaken in an all–rocket mode (mode 4).

UF *RBCC engines*

GS engines

. rocket engines

. . **rocket–based combined–cycle engines**

RT air breathing boosters
air breathing engines

hybrid propulsion
integral rocket ramjets
ramjet engines
single stage to orbit vehicles
spacecraft propulsion
supersonic combustion ramjet engines

Rossi X Ray Timing Explorer

USE **X Ray Timing Explorer**

RXTE (satellite)

USE **X Ray Timing Explorer**

scarf joints

(added March 1998)

DEF A joint in which the overlapping parts are tapered to form a continuous length, with no increase in dimension at the joint.

GS joints (junctions)

. **scarf joints**

RT bolted joints

bonded joints

lap joints

metal joints

scarfing

scene generation

(added July 1998)

GS imaging techniques

. **scene generation**

simulation

. **scene generation**

RT computer graphics

flight simulation

image reconstruction

scientific visualization

target simulators

screech tones

(added March 1998)

DEF Discrete acoustic tones produced by imperfectly expanded supersonic jets. The phenomenon is a result of a resonant feedback condition involving downstream traveling shear–layer disturbances and upstream traveling acoustic waves.

GS elastic waves

. sound waves

. . noise (sound)

. . . aerodynamic noise

. . . . **screech tones**

frequencies

. acoustic frequencies

. . **screech tones**

RT aeroacoustics

feedback

jet aircraft noise

jet mixing flow

nozzle flow

shear layers

supersonic jet flow

supersonic nozzles

seaborgium

(added May 1998)

GS chemical elements

. **seaborgium**

RT bohrium

dubnium

Sea-viewing Wide Field-of-view Sensor

(added December 1998)

UF *SeaWiFS*

GS scanners

. ocean color scanner

. . **Sea-viewing Wide Field-of-view Sensor**

RT chlorophylls

Coastal Zone Color Scanner
ocean surface
phytoplankton
remote sensors
satellite-borne instruments
water color

SeaWiFS

USE **Sea-viewing Wide Field-of-view
Sensor**

Service Module (ISS)

(added March 1999)

DEF Primary Russian component of the International Space Station providing an early station living quarters and life support system functions to all early elements. Also provides propulsive attitude control and reboost capability for the early station.

GS modules
. space station modules
. . **Service Module (ISS)**

RT International Space Station
life support systems

Shergotty Nakhla Chassigny meteorites

USE **SNC meteorites**

Shuttle Superlightweight Tank

USE **external tanks
propellant tanks**

SLWT (propellant tank)

USE **external tanks
propellant tanks**

smart materials

(added March 1998)

DEF Engineered materials capable of responding to their environment to a significant degree, by virtue of intrinsic properties and/or built-in sensor/actuator elements. Applications of these materials include vibration suppression/isolation, precision positioning, damage detection, and tunable devices.

UF *intelligent materials*
RT actuators
composite materials
electrorheological fluids
electrostriction
ferroelastic materials
ferroelasticity
ferroelectric materials
ferromagnetic materials
∞ materials
piezoelectric ceramics
∞ sensors
shape memory alloys
smart structures
vibration damping

SNC meteorites

(added March 1998)

DEF Meteorites with petrologic characteristics, isotopic signatures, trapped gas compositions, and relatively young crystallization ages (less than 1.3 billion years), which together point to a Martian origin. The name of these meteorites is derived from first three known examples—Shergotty, Nakhla, and Chassigny.

UF *Martian meteorites*
Shergotty Nakhla Chassigny meteorites
GS celestial bodies
. meteorites
. . stony meteorites
. . . achondrites
. . . . **SNC meteorites**
RT chassignites

Mars (planet)
Mars surface
nakhlites
shergottites

sonochemistry

USE **ultrasonic processing**

space station modules

(added November 1998)

GS modules
. **space station modules**
. . Kvant modules
. . Priroda module
. . Service Module (ISS)
. . Unity connecting module
. . Zarya control module
RT air locks
compartments
International Space Station
Mir space station
orbital assembly
space erectable structures
space station structures
spacecraft modules

space tourism

(added April 1999)

GS space industrialization
. **space tourism**
tourism
. **space tourism**
RT space commercialization
space transportation

space weather

(added June 1999)

SN (FOR METEOROLOGICAL CONDITIONS RELATED TO THE MIDDLE AND LOWER ATMOSPHERES OF NON-EARTH PLANETS USE "PLANETARY METEOROLOGY".)
DEF The dynamic, highly variable conditions of the geospace environment that encompasses the sun, the interplanetary medium, and the Earth magnetosphere-ionosphere-thermosphere system. Major contributing factors include variations in the solar wind, solar flares, and solar mass ejections. Effects of space weather phenomena include performance degradation of communication, navigation, and power systems on both spacecraft and ground-based systems; and potential health hazards during extravehicular activity.
RT Advanced Composition Explorer
aerospace environments
aerospace safety
Earth ionosphere
Earth magnetosphere
Earth orbital environments
geomagnetism
ionospheric disturbances
magnetic disturbances
magnetic storms
radiation hazards
solar activity effects
solar terrestrial interactions
space plasmas
weather

spiral bevel gears

(added May 1999)

GS gears
. bevel gears
. . **spiral bevel gears**

Stardust Mission

(added March 1999)

DEF First U.S. mission launched to robotically obtain samples in deep space and return them to Earth. The NASA Discovery-class mission will

return dust samples collected from the debris cloud surrounding the nucleus of Comet Wild 2. Interstellar dust will also be collected. The mission spacecraft takes advantage of an Earth gravity-assist maneuver to reach the comet, and uses an aerogel-based dust collector.

GS space missions
. flyby missions
. . **Stardust Mission**
RT comet nuclei
interstellar matter
Wild 2 comet

stepped leaders

(added August 1999)

GS electric current
. electric discharges
. . lightning
. . . leaders (meteorology)
. . . . **stepped leaders**

superhumps (astronomy)

(added October 1998)

RT accretion disks
astronomical photometry
binary stars
cataclysmic variables
dwarf novae
eclipsing binary stars
stellar spectrophotometry

Terra spacecraft

(added June 1999)

DEF First in a series of EOS (Earth Observing System) spacecraft developed to advance the understanding of the ways that the Earth's lands, oceans, air, ice, and life function as a total environmental system. The spacecraft carries five high-resolution instruments: the Advanced Spaceborne Thermal Emission Radiometer (ASTER), the Clouds and the Earth Radiant Energy System (CERES), the Multi-Angle Imaging Spectroradiometer (MISR), the Moderate Resolution Imaging Spectroradiometer (MODIS), and the Measurements of Pollution in the Troposphere (MOPITT) instrument.

UF *AM-1 (EOS) spacecraft*
EOS AM-1 spacecraft
GS artificial satellites
. **Terra spacecraft**
Earth Observing System (EOS)
. **Terra spacecraft**
RT Earth observations (from space)
remote sensing

thermal lenses

USE **thermal lensing**

thermal lensing

(added November 1998)

UF *thermal lenses*
GS **thermal lensing**
. thermal blooming
RT atmospheric optics
focusing
laser beams
photothermal deflection spectroscopy
wave front deformation

thermocapillary migration

(added September 1999)

DEF Phenomenon where droplets (or bubbles) in a host fluid with a uniform temperature gradient migrate to the hot end of the host fluid because of the temperature dependence of the interfacial energy of the droplets.

RT bubbles
capillary flow

time domain analysis

- drops (liquids)
- electromigration
- interfacial tension
- Marangoni convection
- microgravity
- space processing
- temperature gradients
- thermomigration

time domain analysis

(added April 1999)

- GS analysis (mathematics)
 - . **time domain analysis**
 - . . finite difference time domain method
- RT control systems design
 - dynamic response
 - parameter identification
 - signal processing
- ∞ time response

time synchronization

(added December 1998)

- GS synchronism
 - . **time synchronization**
- RT clocks
 - frequency standards
 - frequency synchronization
 - Global Positioning System
 - time measurement
 - time signals
 - universal time

Titan 4B launch vehicle

(added October 1998)

- GS launch vehicles
 - . Titan launch vehicles
 - . . Titan 4 launch vehicle
 - . . . **Titan 4B launch vehicle**
- rocket vehicles
 - . multistage rocket vehicles
 - . . Titan launch vehicles
 - . . . Titan 4 launch vehicle
 - **Titan 4B launch vehicle**
- RT Cassini mission
 - laser gyroscopes

tourism

(added April 1999)

- GS **tourism**
 - . space tourism
- RT industries
 - recreation
 - transportation
- ∞ travel

TRACE satellite

USE **Transition Region and Coronal Explorer**

Transition Region and Coronal Explorer

(added May 1998)

DEF Small Explorer Mission satellite supporting the investigation of the relationships between fine-scale magnetic fields and their associated plasma structures in the transition region and lower corona of the Sun.

- UF *TRACE satellite*
- GS artificial satellites
 - . scientific satellites
 - . . Explorer satellites
 - . . . **Transition Region and Coronal Explorer**
- RT chromosphere
 - SOHO Mission
 - solar atmosphere
 - solar corona
 - solar magnetic field

- solar observatories
- solar physics
- solar transition region

transplutonic planets

USE **hypothetical planets**

transverse momentum

(added June 1999)

- GS momentum
 - . **transverse momentum**
- RT angular momentum
 - elementary particle interactions
 - particle motion
 - transverse acceleration

Treffitz method

(added July 1998)

DEF Boundary-type approximation scheme for the solution of boundary value problems for partial differential equations.

- UF *hybrid-Treffitz finite element method*
- GS analysis (mathematics)
 - . numerical analysis
 - . . approximation
 - . . . boundary element method
 - **Treffitz method**
- RT bending theory
 - boundary conditions
 - boundary value problems
 - finite element method
 - partial differential equations
 - plate theory
 - structural analysis

TRMM satellite

(added May 1998)

DEF Satellite supporting the joint US-Japanese Tropical Rainfall Measuring Mission (TRMM) to explore tropical rainfall and its effects on the Earth energy budget, general circulation, and climate. The TRMM satellite represents the first dual deployment of a precipitation radar and passive microwave radiometer on an Earth-viewing satellite.

- UF *Tropical Rainfall Measuring Mission sat*
- GS artificial satellites
 - . meteorological satellites
 - . . **TRMM satellite**
 - . . scientific satellites
 - . . . **TRMM satellite**
- RT atmospheric circulation
 - Earth radiation budget
 - equatorial atmosphere
 - rain
 - tropical meteorology

Tropical Rainfall Measuring Mission sat

USE **TRMM satellite**

Ukrainian space program

(added January 1999)

- GS programs
 - . space programs
 - . . **Ukrainian space program**
- RT Ukraine
 - Zenit launch vehicles

ultrasonic processing

(added June 1998)

DEF The use of ultrasonic radiation to synthesize a compound or material, or alter the structure, properties, or form of a material.

- UF *sonochemistry*
 - ultrasonic treatment*
- RT ∞ processing
 - ultrasonic cleaning

- ultrasonics

ultrasonic treatment

USE **ultrasonic processing**

undercooling

USE **supercooling**

Unity connecting module

(added November 1998)

DEF Component of the International Space Station providing six ports that serve as connecting points for other station modules and framework elements.

- GS modules
 - . space station modules
 - . . **Unity connecting module**
- RT International Space Station
 - spacecraft docking

VentureStar launch vehicle

(added June 1999)

DEF Reusable single-stage-to-orbit launch vehicle employing linear aerospike engines, and having a payload capacity roughly equivalent to that of the Space Shuttle; developed in coordination with the X-33 advanced technology demonstrator vehicle.

- GS aerospace vehicles
 - . aerospace planes
 - . . **VentureStar launch vehicle**
 - . . maneuverable spacecraft
 - . . aerospace planes
 - . . . **VentureStar launch vehicle**
 - . . . manned spacecraft
 - . . . aerospace planes
 - **VentureStar launch vehicle**
 - recoverable spacecraft
 - reusable spacecraft
 - aerospace planes
 - **VentureStar launch vehicle**
 - soft landing spacecraft
 - aerospace planes
 - **VentureStar launch vehicle**
- RT aerospike engines
 - commercial spacecraft
 - X-33 reusable launch vehicle

very large transport aircraft

(added November 1998)

DEF Aircraft capable of a maximum takeoff weight greater than 400 metric tons (881,600 lbs) or having a seating capacity greater than 660.

- UF *VLTA (aircraft)*
- GS transport aircraft
 - . **very large transport aircraft**
- RT cargo aircraft
 - passenger aircraft

VLTA (aircraft)

USE **very large transport aircraft**

water sampling

(added March 1998)

DEF The process of obtaining a representative sample of water from any natural or artificial environment.

- GS sampling
 - . **water sampling**
- RT environmental monitoring
 - ground water
 - pollution monitoring
 - sea water
 - surface water
 - water

water pollution
water quality

wave rotors

(added March 1998)

DEF Rotor devices that use gasdynamic waves to transfer energy rather than the motion of solid surfaces. Typically, they consist of a series of passages arranged on a drum which rotates about an axis. Through rotation, the ends of the passages are periodically exposed to various circumferentially arranged ports which initiate the traveling expansion or compression waves within the passages. The particular circumferential location of the ports determines the thermodynamic cycle of the working fluid.

GS rotating bodies
. rotors

. . **wave rotors**

RT compression waves
energy transfer
engine parts
gas dynamics
gas generators
gas turbine engines
topping cycle engines
turbomachinery
turboshafts
wave generation

weakly interacting massive particles

(added November 1999)

DEF Hypothetical elementary particles predicted by supersymmetry theories, that interact only through gravity and weak-type interactions; postulated to account for dark matter in the Universe.

UF *cosmions*
WIMPs (astronomy)

GS particles
. elementary particles
. . hypothetical particles
. . . **weakly interacting massive particles**

RT dark matter
missing mass (astrophysics)
solar neutrinos

WIG vehicles

USE **wing-in-ground effect vehicles**

Wild 2 comet

(added March 1999)

DEF Periodic comet, discovered January 1978, relatively new to the inner Solar System due to a shift in its orbit caused by the gravitational influence of Jupiter.

GS celestial bodies
. comets
. . **Wild 2 comet**

RT Stardust Mission

WIMPs (astronomy)

USE **weakly interacting massive particles**

wing-body and tail configurations

USE **body-wing and tail configurations**

wing-body configurations

USE **body-wing configurations**

wing-in-ground effect vehicles

(added December 1999)

DEF Vehicles designed to fly about half their mean chord above the surface, taking advantage of the reduced drag and increased lift caused by ground effect. These vehicles, also known as

WIGs or WIGEs, normally operate above a water surface.

UF *ekranoplanes*
WIG vehicles
GS ground effect machines
. **wing-in-ground effect vehicles**
RT ground effect (aerodynamics)
surface effect ships

X-32 aircraft

(added October 1998)

DEF Experimental supersonic strike fighter developed to be configured as a conventional or short takeoff/vertical landing vehicle. Developed as part of the Joint Strike Fighter (JSF) program.

GS Boeing aircraft
. **X-32 aircraft**
jet aircraft
. **X-32 aircraft**
research vehicles
. research aircraft
. . **X-32 aircraft**
supersonic aircraft
. **X-32 aircraft**
V/STOL aircraft
. **X-32 aircraft**

X-35 aircraft

(added October 1998)

DEF Experimental strike fighter incorporating a vertical lift fan for short takeoff/vertical landing capability. Developed as part of the Joint Strike Fighter (JSF) program.

GS jet aircraft
. **X-35 aircraft**
Lockheed aircraft
. **X-35 aircraft**
research vehicles
. research aircraft
. . **X-35 aircraft**
V/STOL aircraft
. **X-35 aircraft**

X-43 vehicle

(added September 1999)

DEF The experimental research vehicle of the NASA Hyper-X program designed to flight validate key propulsion and related technologies for air-breathing hypersonic aircraft.

GS aerospace vehicles
. **X-43 vehicle**
hypersonic vehicles
. **X-43 vehicle**
research vehicles
. **X-43 vehicle**
RT hypersonic flight
Pegasus air-launched booster
supersonic combustion ramjet engines

Zarya control module

(added November 1998)

DEF Component of the International Space Station providing propulsion, steering, and communications during the early assembly stages of the station; later serving as a docking port and fuel tank. Zarya was built by Russia under contract to the U.S. and is owned by the U.S.

GS modules
. space station modules
. . **Zarya control module**
RT International Space Station

Zenit launch vehicles

(added January 1999)

GS launch vehicles
. **Zenit launch vehicles**
RT sea launching
Ukrainian space program

zero sum games

(added October 1998)

GS games
. **zero sum games**
RT differential games
Markov processes
optimal control
pursuit-evasion games
saddle points (game theory)

NASA THESAURUS SUPPLEMENT

PART 2 ROTATED TERM DISPLAY

NUMERALS

AM- **1** (EOS) spacecraft
use Terra spacecraft

Deep Space **1** Mission

EOS AM- **1** spacecraft
use Terra spacecraft

Wild **2** comet

H- **2** control

Delta **3** launch vehicle

Delta **4** launch vehicle

Titan **4B** launch vehicle

X- **32** aircraft

X- **35** aircraft

X- **43** vehicle

Mars Surveyor **98** Lander
use Mars Polar Lander

Mars Surveyor **98** Orbiter
use Mars Climate Orbiter

Mars Surveyor **98** Program

Boeing **717** aircraft

Mars Surveyor **2001** Mission

A

ACE satellite
use Advanced Composition Explorer

content- **addressable** memory
use associative memory

Advanced Composition Explorer

Darkstar unmanned **aerial** vehicle
use pilotless aircraft
reconnaissance aircraft

aeroshells

Boeing 717 **aircraft**

very large transport **aircraft**

VLTA **(aircraft)**
use very large transport aircraft

X-32 **aircraft**

X-35 **aircraft**

Alpha Magnetic Spectrometer

AM-1 (EOS) spacecraft
use Terra spacecraft

EOS **AM-1** spacecraft
use Terra spacecraft

AMS (spectrometer)
use Alpha Magnetic Spectrometer

frequency domain **analysis**

time domain **analysis**

anisoplanatism

antenna gain

antiphase boundaries

antiphase domains
use antiphase boundaries

proton- **antiproton** interactions

APB (materials)
use antiphase boundaries

archaeomagnetism
use paleomagnetism

associative memory

associative storage
use associative memory

MACHOs **(astronomy)**
use massive compact halo objects

superhumps **(astronomy)**

WIMPs **(astronomy)**
use weakly interacting massive particles

Chandra X Ray **Astrophysics** Facility
use X Ray Astrophysics Facility

embedded **atom** method

modified embedded **atom** method
use embedded atom method

B

Planet- **B** spacecraft
use Nozomi Mars Orbiter

kink **bands**

rocket- **based** combined-cycle engines

lithium **batteries**

Euler-Bernoulli **beam** theory
use Euler-Bernoulli beams

Euler-Bernoulli **beams**

Euler- **Bernoulli** beam theory
use Euler-Bernoulli beams

Euler- **Bernoulli** beams

bevel gears

spiral **bevel** gears

biomass burning

Biot-Savart law

wing- **body** and tail configurations
use body-wing and tail configurations

wing- **body** configurations
use body-wing configurations

Boeing 717 aircraft

bohrium

Bond number

Hale- **Bopp** comet

antiphase **boundaries**

biomass **burning**

C

digital **cameras**

cascode devices

chain reactions (chemistry)

chain reactions (nuclear physics)

Chandra X Ray Astrophysics Facility
use X Ray Astrophysics Facility

Shergotty Nakhla **Chassigny** meteorites
use SNC meteorites

chain reactions **(chemistry)**

EAM (physical **chemistry)**
use embedded atom method

MEAM (physical **chemistry)**
use embedded atom method

clamped structures

environmental **cleanup**

Mars **Climate** Orbiter

cloud-to- **cloud** discharges

rocket-based **cloud**–to–ground discharges
 Hale–Bopp **combined**–cycle engines
 Wild 2 **comet**
Comet Nucleus Tour
 free–space optical **communication**
 massive **compact** halo objects
 Advanced **Composition** Explorer
 enantiomeric **compounds**
use enantiomers
 nacelle wing **configurations**
use wing nacelle configurations
 wing–body **configurations**
use body–wing configurations
 wing–body and tail **configurations**
use body–wing and tail configurations
 Unity **connecting** module
content–addressable memory
use associative memory
CONTOUR (mission)
use Comet Nucleus Tour
 H–2 **control**
 Zarya **control** module
Cooper–Harper ratings
 Transition Region and **Coronal** Explorer
corrugated waveguides
cosmions
use weakly interacting massive particles
critical current
cuprates
 critical **current**
 rocket–based combined–**cycle** engines
cycloaddition

D

Darkstar unmanned aerial vehicle
use pilotless aircraft
 reconnaissance aircraft
 photothermal **Deep** Space 1 Mission
deflection spectroscopy
deformable mirrors
Delta 3 launch vehicle
Delta 4 launch vehicle
 orbit **determination**
 cascode **devices**
 MEMS (electromechanical **devices**)
use microelectromechanical systems
dielectric waveguides
 finite **difference** time domain method
differential games
digital cameras
 cloud–to–cloud **discharges**
 cloud–to–ground **discharges**
 intracloud **discharges**
 frequency **domain** analysis
 time **domain** analysis
 finite difference time **domain** method
 antiphase **domains**
use antiphase boundaries
DS1 (space mission)
use Deep Space 1 Mission
dubnium

E

EAM (physical chemistry)
use embedded atom method
 Josephson **effect**
 wing–in–ground **effect** vehicles
ekranoplanes
use wing–in–ground effect vehicles
 PML **(electromagnetism)**
use perfectly matched layers
 MEMS **(electromechanical** devices)
use microelectromechanical systems
electronic structure
 hybrid–Trefftz finite **element** method
use finite element method
 Trefftz method
embedded atom method
 modified **embedded** atom method
use embedded atom method
enantiomeric compounds
use enantiomers
enantiomers
enantiomorphs
use enantiomers
 renewable **energy**
 RBCC **engines**
use rocket–based combined–cycle engines
 rocket–based combined–cycle **engines**
environmental cleanup
 AM–1 **(EOS)** spacecraft
use Terra spacecraft
EOS AM–1 spacecraft
use Terra spacecraft
Euler–Bernoulli beam theory
use Euler–Bernoulli beams
Euler–Bernoulli beams
evanescent waves
 pursuit–**evasion** games
 Advanced Composition **Explorer**
 Rossi X Ray Timing **Explorer**
use X Ray Timing Explorer
 Transition Region and Coronal **Explorer**

F

Chandra X Ray Astrophysics **Facility**
use X Ray Astrophysics Facility
FDTD (mathematics)
use finite difference time domain method
 heavy **fermion** superconductors
 heavy **fermion** systems
ferroelastic materials
ferroelasticity
fiber pushout
 Sea–viewing Wide **Field**–of–view Sensor
field tests
 Gabor **filters**
finite difference time domain method
 hybrid–Trefftz **finite** element method
use finite element method
 Trefftz method
 in– **flight** simulation
 Ringleb **flow**
free–space optical communication
free–space optical interconnects
frequency domain analysis

- FSOI** (integrated optics)
use free-space optical interconnects
- fullerides**
- fuselage**–wing stores
use wing-fuselage stores
- fusion** propulsion
- G**
- Gabor** filters
- Gabor** transformation
- antenna **gain**
- games**
- differential **games**
- pursuit-evasion **games**
- zero sum **games**
- bevel **gears**
- spiral bevel **gears**
- scene **generation**
- Next **Generation** Space Telescope project
- Genesis** mission
- Mars **Global** Surveyor
- glucocorticoids**
- Godunov** method
- cloud-to-**ground** discharges
- wing-in-**ground** effect vehicles
- H**
- H-2** control
- Hale-Bopp** comet
- massive compact **halo** objects
- hardware**–in-the-loop simulation
- hardware**–in-the-loop tests
use hardware-in-the-loop simulation
- Cooper-**Harper** ratings
- hassium**
- head** up tilt
- heavy** fermion superconductors
- heavy** fermion systems
- heavy** metals
- hindcasting**
- HUT** (physiology)
use head up tilt
- hybrid**–Trefftz finite element method
use finite element method
Trefftz method
- hypothetical** particles
- Phaethon (**hypothetical** planet)
use hypothetical planets
- hypothetical** planets
- I**
- Population **III** stars
- inflight** simulation
use in-flight simulation
- FSOI (**integrated** optics)
use free-space optical interconnects
- intelligent** materials
use smart materials
- weakly **interacting** massive particles
- proton-antiproton **interactions**
- intercalibration**
- free-space optical **interconnects**
- optical **interconnects**
- intracloud** discharges
- ion** optics
- Iridium** network
- Iridium** satellites
use communication satellites
Iridium network
- Service Module (**ISS**)
- J**
- Java** (programming language)
- scarf **joints**
- Josephson** effect
- Josephson** tunneling
use Josephson effect
- K**
- kink** bands
- kinking**
- L**
- Mars Polar **Lander**
- Mars Surveyor 98 **Lander**
use Mars Polar Lander
- Java (programming **language**)
- very **large** transport aircraft
- Delta 3 **launch** vehicle
- Delta 4 **launch** vehicle
- Titan 4B **launch** vehicle
- VentureStar **launch** vehicle
- Long March **launch** vehicles
- Zenit **launch** vehicles
- Laves** phases
- Biot-Savart **law**
- perfectly matched **layers**
- stepped **leaders**
- thermal **leaders** (meteorology)
- thermal **lenses**
use thermal lensing
- thermal **lensing**
- lithium** batteries
- Long** March launch vehicles
- hardware-in-the-**loop** simulation
- hardware-in-the-**loop** tests
- Lunar** Prospector
- M**
- MACHOs** (astronomy)
use massive compact halo objects
- magnetic** nozzles
- Alpha **Magnetic** Spectrometer
- magnetostratigraphy**
- Long **March** launch vehicles
- Mars** Climate Orbiter
- Mars** Global Surveyor
- Mars** missions
- Nozomi **Mars** Orbiter
- Mars** Polar Lander
- Mars** Surveyor 98 Lander
use Mars Polar Lander
- Mars** Surveyor 98 Orbiter
use Mars Climate Orbiter
- Mars** Surveyor 98 Program
- Mars** Surveyor 2001 Mission
- Martian** meteorites
use SNC meteorites
- massive** compact halo objects
- weakly interacting **massive** particles
- perfectly **matched** layers
- APB **(materials)**
use antiphase boundaries

materials

ferroelastic **materials**
 intelligent **materials**
 use smart materials
 smart **materials**
 FDTD **(mathematics)**
 use finite difference time domain method
 MEAM (physical chemistry)
 use embedded atom method
 Tropical Rainfall **Measuring Mission** sat
 use TRMM satellite
meitnerium
 associative **memory**
 content-addressable **memory**
 use associative memory
 MEMS (electromechanical devices)
 use microelectromechanical systems
 heavy **metals**
 Martian **meteorites**
 use SNC meteorites
 Shergotty Nakhla Chassigny **meteorites**
 use SNC meteorites
 SNC **meteorites**
 leaders **(meteorology)**
 embedded atom **method**
 finite difference time domain **method**
 Godunov **method**
 hybrid-Treftz finite element **method**
 use finite element method
 Treftz method
 modified embedded atom **method**
 use embedded atom method
 Treftz **method**
 in vitro **methods** and tests
 in vivo **methods** and tests
MGS (spacecraft)
 use Mars Global Surveyor
microelectromechanical systems
microsatellites
microsats
 use microsatellites
 thermocapillary **migration**
Mindlin plate theory
 use Mindlin plates
Mindlin plates
 Reissner- **Mindlin** plates
 use Mindlin plates
 deformable **mirrors**
mischmetal
 CONTOUR **(mission)**
 use Comet Nucleus Tour
 Deep Space 1 **Mission**
 DS1 (space **mission**)
 use Deep Space 1 Mission
 Genesis **mission**
 Mars Surveyor 2001 **Mission**
 Stardust **Mission**
 Tropical Rainfall Measuring **Mission** sat
 use TRMM satellite
 Mars **missions**
modified embedded atom method
 use embedded atom method
 Unity connecting **module**
 Zarya control **module**
 Service **Module** (ISS)
 space station **modules**
 transverse **momentum**

N

nacelle wing configurations
 use wing nacelle configurations
 Shergotty **Nakhla** Chassigny meteorites
 use SNC meteorites
nanosatellites
nanosats
 use nanosatellites
 proportional **navigation**
 Iridium **network**
Next Generation Space Telescope project
NGST project
 use Next Generation Space Telescope project
Nozomi Mars Orbiter
 magnetic **nozzles**
 chain reactions **(nuclear** physics)
 Comet **Nucleus** Tour
 Bond **number**

O

massive compact halo **objects**
 pilot **opinion** ratings
 use pilot ratings
 free-space **optical** communication
optical interconnects
 free-space **optical** interconnects
 FSOI (integrated **optics**)
 use free-space optical interconnects
 ion **optics**
orbit determination
 Mars Climate **Orbiter**
 Mars Surveyor 98 **Orbiter**
 use Mars Climate Orbiter
 Nozomi Mars **Orbiter**

P

hypothetical **particles**
 weakly interacting massive **particles**
PDS (spectroscopy)
 use photothermal deflection spectroscopy
perfectly matched layers
Phaethon (hypothetical planet)
 use hypothetical planets
 Laves **phases**
Phobos spacecraft
photothermal deflection spectroscopy
 EAM **(physical** chemistry)
 use embedded atom method
 MEAM **(physical** chemistry)
 use embedded atom method
 chain reactions (nuclear **physics**)
 HUT **(physiology)**
 use head up tilt
pilot opinion ratings
 use pilot ratings
pilot ratings
 Phaethon (hypothetical **planet**)
 use hypothetical planets
Planet-B spacecraft
 use Nozomi Mars Orbiter
planet X
 use hypothetical planets
 hypothetical **planets**

transplutonic **planets**
use hypothetical planets

Mindlin **plate** theory
use Mindlin plates

Mindlin **plates**

Reissner–Mindlin **plates**
use Mindlin plates

PML (electromagnetism)
use perfectly matched layers

Mars **Polar** Lander

polyvinylidene
use vinylidene

Population III stars

primordial stars
use Population III stars

ultrasonic **processing**

Mars Surveyor 98 **Program**

Ukrainian space **program**

Java **(programming** language)

Next Generation Space Telescope **project**

NGST **project**
use Next Generation Space Telescope project

SLWT **(propellant** tank)
use external tanks
 propellant tanks

proportional navigation

fusion **propulsion**

Lunar **Prospector**

proton–antiproton interactions

pursuit–evasion games

fiber **pushout**

R

Tropical **Rainfall** Measuring Mission sat
use TRMM satellite

Cooper–Harper **ratings**

pilot **ratings**

pilot opinion **ratings**
use pilot ratings

Chandra X **Ray** Astrophysics Facility
use X Ray Astrophysics Facility

Rossi X **Ray** Timing Explorer
use X Ray Timing Explorer

RBCC engines
use rocket-based combined-cycle engines

chain **reactions** (chemistry)

chain **reactions** (nuclear physics)

Transition **Region** and Coronal Explorer

Reissner–Mindlin plates
use Mindlin plates

renewable energy

Ringleb flow

rocket–based combined-cycle engines

Rossi X Ray Timing Explorer
use X Ray Timing Explorer

wave **rotors**

RXTE (satellite)
use X Ray Timing Explorer

S

water **sampling**

Tropical Rainfall Measuring Mission **sat**
use TRMM satellite

ACE **satellite**
use Advanced Composition Explorer

RXTE **(satellite)**
use X Ray Timing Explorer

TRACE **satellite**
use Transition Region and Coronal Explorer

TRMM **satellite**

Iridium **satellites**
use communication satellites
 Iridium network

Biot–**Savart** law

scarf joints

scene generation

screech tones

Sea–viewing Wide Field-of-view Sensor

seaborgium

SeaWiFS
use Sea-viewing Wide Field-of-view Sensor

Sea-viewing Wide Field-of-view **Sensor**

Service Module (ISS)

Shergotty Nakhla Chassigny meteorites
use SNC meteorites

Shuttle Superlightweight Tank
use external tanks
 propellant tanks

hardware-in-the-loop **simulation**

in-flight **simulation**

inflight **simulation**
use in-flight simulation

SLWT (propellant tank)
use external tanks
 propellant tanks

smart materials

SNC meteorites

sonochemistry
use ultrasonic processing

Deep **Space** 1 Mission

DS1 **(space** mission)
use Deep Space 1 Mission

free-**space** optical communication

free-**space** optical interconnects

Ukrainian **space** program

space station modules

Next Generation **Space** Telescope project

space tourism

space weather

AM-1 (EOS) **spacecraft**
use Terra spacecraft

EOS AM-1 **spacecraft**
use Terra spacecraft

MGS **(spacecraft)**
use Mars Global Surveyor

Phobos **spacecraft**

Planet-B **spacecraft**
use Nozomi Mars Orbiter

Terra **spacecraft**

Alpha Magnetic **Spectrometer**

AMS **(spectrometer)**
use Alpha Magnetic Spectrometer

(spectroscopy)

PDS **(spectroscopy)**
use photothermal deflection spectroscopy

photothermal deflection **spectroscopy**
spiral bevel gears
Stardust Mission

Population III **stars**
 primordial **stars**
use Population III stars

space **station** modules
stepped leaders

associative **storage**
use associative memory

fuselage-wing **stores**
use wing-fuselage stores

electronic **structure**
 clamped **structures**
 zero **sum** games

heavy fermion **superconductors**
superhumps (astronomy)

Shuttle **Superlightweight** Tank
use external tanks propellant tanks

Mars Global **Surveyor**
 Mars **Surveyor** 98 Lander
use Mars Polar Lander

Mars **Surveyor** 98 Orbiter
use Mars Climate Orbiter

Mars **Surveyor** 98 Program
 Mars **Surveyor** 2001 Mission

time **synchronization**

heavy fermion **systems**
 microelectromechanical **systems**

T

wing-body and **tail** configurations
use body-wing and tail configurations

Shuttle Superlightweight **Tank**
use external tanks propellant tanks

SLWT (propellant **tank**)
use external tanks propellant tanks

Next Generation Space **Telescope** project
Terra spacecraft

field **tests**
 hardware-in-the-loop **tests**
use hardware-in-the-loop simulation

in vitro methods and **tests**
 in vivo methods and **tests**

Euler-Bernoulli beam **theory**
use Euler-Bernoulli beams

Mindlin plate **theory**
use Mindlin plates

thermal lenses
use thermal lensing

thermal lensing
thermocapillary migration

head up **tilt**
time domain analysis

finite difference **time** domain method
time synchronization

Rossi X Ray **Timing** Explorer
use X Ray Timing Explorer

Titan 4B launch vehicle

screech **tones**

Comet Nucleus **Tour**

tourism
 space **tourism**
TRACE satellite
use Transition Region and Coronal Explorer

Gabor **transformation**
Transition Region and Coronal Explorer

transplutonic planets
use hypothetical planets

very large **transport** aircraft
transverse momentum

ultrasonic **treatment**
use ultrasonic processing

hybrid- **Trefftz** finite element method
use finite element method Trefftz method

Trefftz method

TRMM satellite

Tropical Rainfall Measuring Mission sat
use TRMM satellite

Josephson **tunneling**
use Josephson effect

U

Ukrainian space program

ultrasonic processing

ultrasonic treatment
use ultrasonic processing

undercooling
use supercooling

Unity connecting module

Darkstar **unmanned** aerial vehicle
use pilotless aircraft reconnaissance aircraft

head **up** tilt

V

Darkstar unmanned aerial **vehicle**
use pilotless aircraft reconnaissance aircraft

Delta 3 launch **vehicle**
 Delta 4 launch **vehicle**
 Titan 4B launch **vehicle**
 VentureStar launch **vehicle**
 X-43 **vehicle**
 Long March launch **vehicles**
 WIG **vehicles**
use wing-in-ground effect vehicles

wing-in-ground effect **vehicles**
 Zenit launch **vehicles**

VentureStar launch vehicle

very large transport aircraft

view Sensor

Sea-viewing Wide Field-of-view **viewing** Wide Field-of-view Sensor

in **vitro** methods and tests
 in **vivo** methods and tests

VLTA (aircraft)
use very large transport aircraft

W

water sampling

wave rotors

corrugated **waveguides**
 dielectric **waveguides**

evanescent **waves**
weakly interacting massive particles
 space **weather**
 Sea-viewing **Wide** Field-of-view Sensor
WIG vehicles
use wing-in-ground effect vehicles
Wild 2 comet
WIMPs (astronomy)
use weakly interacting massive particles
wing-body and tail configurations
use body-wing and tail configurations
wing-body configurations
use body-wing configurations
 nacelle **wing** configurations
use wing nacelle configurations
wing-in-ground effect vehicles
 fuselage- **wing** stores
use wing-fuselage stores

X

planet **X**
use hypothetical planets
X-32 aircraft
X-35 aircraft
X-43 vehicle
 Chandra **X** Ray Astrophysics Facility
use X Ray Astrophysics Facility
 Rossi **X** Ray Timing Explorer
use X Ray Timing Explorer

Z

Zarya control module
Zenit launch vehicles
zero sum games

NASA THESAURUS SUPPLEMENT

PART 3 CHANGES

No term changes or deletions were made during this period.

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